



Measuring the Impact of the Emissions Trading Scheme in Official Statistics

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1 Overview

The introduction of an emissions trading scheme (ETS) raises measurement issues for a national statistics office. There has been considerable thinking internationally on how to best reflect schemes of this type.

Measuring the Impact of the Emissions Trading Scheme in Official Statistics outlines where and how the impacts of an ETS scheme in New Zealand will be shown in the current Official Statistics System (OSS), as well as informs readers on the conceptual options available to measure the ETS.

An earlier version of this paper was submitted to the Advisory Committee on Economic Statistics (ACES) on 30 October 2008. That draft outlined the understanding of the proposed emissions trading scheme (ETS) at that time, and the options for treatment of the emissions trading within current statistical frameworks. ACES was advised that the operational aspects of the ETS were not yet finalised and many questions remained. Therefore, the treatment outlined in the earlier paper was based on current knowledge at the time but could change as further information was obtained.

Full international consensus on operationalising the treatment of ETS and the like has not yet been reached. However, this paper updates the earlier thinking and presents recent international perspectives. Users will be informed when final decisions are reached.

Key features to note about the measurement of the impact of the ETS are:

- ETS transactions between residents and non-residents are currently treated as intangible non-produced non-financial assets in the Balance of Payments (BoP) statistics.
- Individual transactions in derivatives associated with carbon emissions will be captured in the BoP statistics but will not be separately identifiable from other financial derivatives.
- The international treatment of emissions trading in the National Accounts is still being decided.
- The impact of the emissions trading will not be captured directly in the current suite of National Accounts (and related) measures, although they will be indirectly captured in many of the National Accounts data sources. It will be difficult, if not impossible, to distinguish the impact of the ETS scheme on the National Accounts from that of other factors.
- Environmental measurement statistics will be undertaken by agencies other than Statistics New Zealand (eg the Ministry for the Environment will measure the rate of emissions in the Greenhouse Gas Inventory and changes in land use via the Land Use and Carbon Analysis System (LUCAS)).
- These environmental measures will record changes that may arise from the ETS scheme, but not its economic effectiveness.

- Greenhouse gas emissions and energy efficiency have been identified as core topics in the finalised energy domain plan and environmental domain plan currently under development.
- The purchase of emissions units will not directly appear in the current suite of price indexes (consumers price index, producers price index).
- Indirect price impacts from the operation of the ETS scheme will be captured, but the attribution of how much of a price change is due to the operation of the ETS scheme will not be possible.
- The Annual Enterprise Survey (AES) will capture some information, but under the current questions this data will not be identifiable.

Statistics NZ invites comments on any issues raised in this paper (email to John.Morris@stats.govt.nz).

2 Introduction

In 2008 the New Zealand Government passed legislation to set up an emissions trading scheme (ETS). A new Government formed after the 2008 general election amended this legislation in November 2009.

The ETS is an economic mechanism to encourage the reduction of greenhouse gas emissions. The reduction of greenhouse gas emissions is covered by the United Nations Framework Convention on Climate Change and obligations under the Kyoto Protocol were agreed to by New Zealand in December 2002. As the Ministry for the Environment (MfE) website states (MfE, nd), “New Zealand is prepared to take on a responsibility target for greenhouse gas emissions reductions of between 10 per cent and 20 per cent below 1990 levels by 2020, if there is a comprehensive global agreement, and other New Zealand conditions are met.” The New Zealand ETS scheme is the mechanism chosen to achieve this.

The next chapters discuss:

- chapter 3 – the extent of Statistics NZ’s role in measuring emissions trading
- chapter 4 – different conceptual options in the statistical treatment of ETS schemes and recommendations for treatment
- chapter 5 – what will be captured in current New Zealand official statistics (without any methodology change) under different treatment options, and any gaps in the existing coverage
- chapter 6 – conclusions reached.

Supplementary information is covered in:

- appendix 1 – what is known about the ETS scheme in New Zealand
- appendix 2 – a selection of similar ETS schemes operating or proposed around the world
- appendix 3 – background of this paper
- appendix 4 – information on New Zealand’s taxation treatment of ETS.

3 Role of a national statistics office

What is the role of the national statistics office (NSO) in measuring the impact of the ETS in New Zealand?

As an NSO, Statistics NZ is responsible for maintaining a suite of relevant macroeconomic and industry statistics. With the introduction of the ETS, the NSO is required to:

- assess ETS impact
- make decisions around its conceptual classification
- decide on treatment based on the classification and purposes of the various measures
- make changes to collections, systems, and outputs to accommodate the treatment of the ETS impact within the current set of statistics.

This paper deals with these requirements by looking at the introduction of ETS and its probable treatment within existing official statistics.

A potential role for an NSO is to deliver statistics that answer a wide range of questions about such a change. This possibly requires producing statistics on the actual event itself (as opposed to the impact of the event). In November 2008, Statistics Denmark presented a paper (Olsen, 2008) at a meeting of the Advisory Expert Group on National Accounts in Washington. The paper gave a list of questions around an ETS scheme deemed legitimate by an NSO. These questions included:

- What is the origin of the credits (ie freely issued by government, purchased from abroad, or purchased from government)?
- From where have industries received their credits?
- Who owns/holds the credits (emitting industries, units engaged in arbitrage, non-governmental organisations, and private households)?
- Who is actually trading credits (volume of trade, value of trade, within industry trades, as imports or exports)?
- What is the relationship between use of energy and gas emissions?
- What is the relationship between credits and gas emissions?

To what extent should the OSS provide information to allow these questions to be answered? Are these questions more for academics and researchers to respond to, rather than for the OSS to answer? Do the answers require the 'authoritative' or 'official' label by the NSO?

If official statistics are needed to answer these questions, what is the role of the NSO in providing the information required? Does Statistics NZ produce the information itself? Can other government agencies provide the information? If so, can Statistics NZ provide advice, classifications, frameworks, and quality assurance to the government agencies producing the information?

This paper does not attempt to answer these questions, but focuses on the treatment of the ETS impact within the current suite of official statistics.

4 Options for ETS treatment

4.1 Options

A major area of debate among statistical agencies is the treatment of ETS credits in different frameworks. Of the many treatment options available, three have started to emerge as clear candidates. According to these options, ETS credits are:

- a form of asset (either financial or non-tangible)
- a form of taxation imposed by the government on the economy
- a method of bringing an externality (the right to emit carbon) into the production function, and are therefore an operational cost to the production of goods and services.

Each of these options has merit. It may be that different options are adopted for different outputs. The merits and disadvantages of each treatment, and their implications for measurement in different statistics, are discussed in more detail below.

One of the underpinning frameworks of economic statistics is the System of National Accounts (SNA). As a first step we will look to the SNA for guidance on treatment.

The New Zealand National Accounts currently use the System of National Accounts 1993 (SNA93). Mention of ETS credits in this manual is limited. Work is currently being undertaken on an updated System of National Accounts 2008 (SNA08) manual. The SNA08 has addressed the treatment of ETS credits in more detail.

The latest version of SNA (2008) recommends the following treatment: the issuance of emission permits by government is classified as a tax. However, the issued permits will be tradable in an active market and as such are treated as a form of asset when traded by parties other than the government.

The conceptual arguments of each of the three options and the relevance of the SNA recommendation are discussed below.

4.1.1 SNA treatments

4.1.1.1 Non-tangible assets

For an ETS credit to be included in the National Accounts it must be an economic asset. SNA93 defines economic assets as "entities over which ownership rights are enforced by institutional units, individually or collectively; and from which economic benefits may be derived by their owners by holding them, or using them over a period of time". Given that the possession of an ETS credit will allow the holder to gain some benefit (ie release emissions) and they can be held with the possibility of a change in value, ETS credits seem to be some form of economic asset.

An economic asset can either be produced (ie assets that come into existence as outputs of a production process) or non-produced (ie assets that come into existence from some other process than production). The question is: are ETS credits the result of a production process or some other process? Clearly the fact that they are created by legislation would mean that they are non-produced economic assets of some form.

Non-produced economic assets can be either tangible or non-tangible. Tangible non-produced assets occur in nature and ownership of them may be enforced or transferred. Intangible non-produced assets are constructs of society by legal or accounting actions. Some non-produced economic assets entitle their owners to engage in certain specified activities. Examples of tangible non-produced assets are land (in various uses), proven reserves of mineral deposits, virgin (non-cultivated) forest, and water resources. Examples of non-tangible non-produced resources include patents, leases, and other transferable contracts (excluding rental of machinery), and purchased goodwill.

If an ETS credit allows the holder to engage in the activity of releasing specified gases into the atmosphere as part of their production, then the credits would appear to be non-tangible non-produced economic assets from an SNA viewpoint. An alternative argument is that the credit is backed by a forest and therefore, might be classified as a *tangible* non-produced asset (if non-cultivated virgin forest) or a *tangible* produced asset (if plantation forest). A similar case can be argued for fishing quota, that is, is the quota a non-tangible non-produced economic asset or is the fish stock a tangible non-produced asset? The current New Zealand SNA treatment is to classify fishery allowable quota as a right to fish and therefore, a non-tangible non-produced economic asset.

An asset also has a life longer than a production cycle, allowing it to be used (or potentially used) again. Assets usually have a term of more than one year. If credits expired at the end of the year, it would be more appropriate to treat the ETS credits as an operating expense rather than an asset. If the scheme dictates that a stock of ETS credits are held and emissions during the year are recorded and matched with the stock of credits held, then the resulting measurement will show change in the volume (number of credits held) and valuation (market price) of stocks of ETS credits at the start and end of the measurement period.

We have confirmed that under the New Zealand ETS the economic unit (ie firm) will be provided with a number of credits that are valid indefinitely and so, do not void in any way if unused. This is different from some other schemes where there is a time limit on the credits. The nature of ETS in other countries tends toward their being held as a tradable permit to emit gases, and therefore, falls better into the classification as non-tangible non-produced economic assets.

If the unit holding the credit decides to trade the credit, the credit becomes a non-tangible asset and will be treated as such. The unit holding the credit can sell the credit to another unit and record the money received. The new holder of the credit will record that it has purchased a non-tangible asset with a value equal to the price paid. The new unit holding the credit may then choose to revalue the asset based on market prices.

Should a unit purchase a credit from anyone other than the government, the credit is treated as a non-tangible asset. Similarly, should industries that are not compelled to purchase credits choose to do so, they are deemed to have purchased a non-tangible asset.

4.1.1.2 Tax

Under the SNA93 definition, taxes are "compulsory unrequited payments in cash or in kind made by institutional units to government units". This definition acknowledges the fact that the government may or may not provide things of benefit to the unit paying the tax, but that there is no direct link between the tax paid and the benefit (if any) the payer receives from the government. It should be noted that fees that allow ownership or use of certain goods or pursuit of certain activities are treated as taxes, unless they are for some proper regular purpose (such as checking the efficient and safe functioning of equipment or checking the qualifications and/or competence of an individual). Within the possible taxes on production are taxes on pollution consisting of "taxes levied on the emission or discharge into the environment of noxious gases, liquids and other harmful substances".

The acquisition of ETS credits can be seen as a compulsory exercise enforced on an institutional unit by the New Zealand government consistent with the definition of a tax. Certainly, the nature of the payment is unrequited in that the individual unit may not gain anything in return for the payment. The key question around this treatment is: are the ETS credits compulsory? For some industries participation in the ETS is compulsory, while for other industries it is voluntary. For an institutional unit in the liquid fossil fuels sector, the ETS cannot be seen as a tax because it is not compulsory. Even for a unit in an industry where participation is compulsory, is it compulsory to buy ETS credits or is the compulsion to pay for any emissions over and above those covered by any credits they have acquired (as determined by audit)? In this case the tax may not be in the price of the carbon credit but the credit is a means to mitigate a future 'tax' assessment. However, in terms of measurement the price and volume of credits may be as good an indicator of the 'tax' paid as any other measure. While there are elements of the ETS that may fit within a tax definition, the selective nature of the compulsion means that the tax treatment is not a complete conceptual fit.

The draft SNA08 manual makes explicit mention of the treatment of ETS credits. It recommends treating the issuance of credits by the government to other units as a tax in the first instance (ie the economic unit is forced to pay money to government to be able to emit carbon and other gases, see above).

If there is a payment greater than zero relating to the transfer of the ETS credit, this is treated as a tax. This could be treated as full payment of the tax or prepayment of future tax. If the credit is used to 'pay' for emissions then it has, in effect, already paid this as a tax (or will use the prepaid tax to offset a later tax bill). Basically this would mean that the cost would only appear as tax if the holder of permit does not trade it with another (non-government) economic unit.

There is currently discussion as to how to operationalise this treatment. It may be easy to account for the taxation portion by recording it as a one-off tax (rather than a prepaid tax). If the tax is treated as prepaid then when the permit is traded, the new holder has gained an asset made up of two parts (a prepaid tax component and a non-tangible asset component).

In general, the New Zealand ETS scheme works (in simple terms) by government giving ETS credits to foresters for the trees (carbon sinks) and by emitters being forced to purchase the credits off the foresters. The government never receives money in these transactions.

The legislation on the ETS allows the New Zealand government to sell credits if they desire. Some sectors have received credit free from the government and in this case the taxation component is necessarily zero. Other sectors will have to purchase credits from the government, thus money gained from such sales would be treated as taxation in the National Accounts.

4.1.1.3 Additional cost in the production function (intermediate consumption)

ETS credits can be viewed as an operational cost in the production function. Previously, producers of goods and services could emit certain gases freely, but under an ETS must now buy a credit to offset gases released. This can be seen as the cost of a permit to release, and would be allocated under 'intermediate consumption' under a National Accounts framework. Intermediate consumption under SNA93 is defined as the value of goods and services consumed as inputs by processes of production. It excludes the consumption of fixed assets. The goods or services may be consumed or transformed in the process. Removal of waste would be included in intermediate consumption as a service. This could be considered an analogy to ETS with the ETS being the cost to remove (emit) gaseous waste.

There is a timing issue with this treatment. Intermediate consumption is recorded not when the good or service is acquired but when it is used. Would it be possible to record ETS credit use on a quarterly basis if the reconciliation between emissions and credits occurred on an annual basis? This could potentially be resolved through modelling quarterly consumption with an annual benchmark derived from the annual reconciliation.

4.2 Current international thinking

The current international consensus for treatment of ETS (as outlined in the draft SNA08 manual) is that payments for emission permits should be recorded as taxes, and once acquired as assets of the permit holder, valued at their market price.

The SNA08 does not specify however, what type of asset permits should be recorded, when they should be recorded, or the value of taxes that should be recorded.

In response to these undecided issues, a task force for the Organisation of Economic Co-operation and Development (OECD) and the Eurostat

(European statistical agency) has been looking at the international treatment of emissions trading schemes for SNA08 treatment. They have agreed on a range of options that are a form of asset treatment. In some cases these assets are issued in return for payment that is treated as a tax. The following section is based on the Task Force's draft final report (OECD/Eurostat, 2010).

The four main options closely considered by the Task Force are:

1. Non-produced non-financial assets – taxes recorded when permits are issued

Permits are issued by the government in return for a tax payment with the permits appearing as an 'other change in volume' in the accounts of the receiving enterprise. Free permits can be imputed or (recommended) ignored.

2. Non-produced non-financial asset – taxes recorded when permits are surrendered

Permits appear as an other change in volume in the accounts of government and at the same time are sold to enterprises. When enterprises surrender permits, governments buy back the permits and enterprises return the cash received as a tax payment. Transactions in free permits can be imputed at issue, but it is easier to ignore them.

3. Financial asset

Permits are financial assets (of what type is yet to be decided) sold by governments (which therefore retain the liabilities). At surrender the financial assets are returned to the government in lieu of tax. Free permits can be ignored but it is preferable to impute them.

4. Split asset

At issue, a financial asset is created, valued at the price of the purchase from government and at any point in time the difference between the market price and the original purchase price is treated as a non-produced financial asset (of a type yet to be determined). The non-produced non-financial asset is created through an other change in volume in the accounts of the acquiring enterprise. A liability corresponding to the financial asset is recorded in the government account and remains the same value (initial purchase price) throughout the life of the permit. At surrender the non-financial part of the asset disappears as an other change in volume and the financial part of the asset is surrendered to government in lieu of its tax payment which is recorded. Free permits are ignored at issue and surrender

The Task Force has struggled to come to a consensus agreement on the preferred option and was split between the financial asset option and the split asset option.

A consensus was reached around the following issues:

- ETS permits issued under cap and trade schemes should be recorded as taxes, with taxes recorded in line with when the emissions occurred.
- The treatment of taxes or subsidies when permits are issued without charge or at cost lower than market price has not been agreed on.

- Changes in the value of permits, in between issue and surrender, are based on market price valuations.
- Treatment of other forms (ie not cap and trade) of emission permits is undecided.

Because it was agreed that the issue needed to be resolved and the Task Force could not come to a unanimous consensus, the Task Force has asked the Inter-Secretariat Working Group on National Accounts (ISWGNA) to recommend one of the options, even if only via convention.

4.3 Statistics NZ's recommended treatment

Statistics NZ will adopt the recommended SNA08 treatment (by the ISWGNA) for ETS. From the issuance of ETS credits, we will treat any non-zero flow of money to the government as a tax, and any trading activity between parties other than the government as the recommended type of asset. This currently appears to be either a financial asset, or some kind of split financial/non-financial asset.

The next section considers the impact this treatment has on currently produced statistics.

5 Capture of emissions trading in current statistics

5.1 Balance of Payments statistics

The trading of carbon emissions rights by New Zealand residents with non-residents is within the scope of Balance of Payments (BoP) statistics. The current reporting guidelines for the compilation of BoP statistics (fifth edition of the International Monetary Fund's *Balance of Payments Manual* (BPM5)) do not explicitly specify how such transactions should be treated or classified. Transactions in emissions trading by New Zealand companies overseas have been identified through one of the surveys used to collect BoP trade in services data. In consultation with the International Monetary Fund (IMF), Statistics NZ has recorded such transactions as intangible non-produced non-financial assets in the BoP capital account.

The draft edition of the revised manual (BPM6) specifically addresses emissions trading. It highlights that the classification of emissions rights is dependent on its relationship to production:

- if payment is made by one enterprise to another in return for cutting emission of harmful substances or withdrawing harmful substances from the atmosphere (eg by growing a forest), then there is an element of production and it is included under other business services
- if the emissions right permits a certain volume of emissions without requiring changes in production processes, then it is classified as an economic asset under contracts, leases, and licenses, and trading of such rights is shown in the capital account as an intangible non-produced non-financial asset.

The treatment in the balance should align with the treatment of emissions trading in the National Accounts. Should the decision on National Accounts treatment be other than an intangible non-produced non-financial asset (eg financial asset) the above treatment in the BoP will be reviewed.

Currently within BoP there is no specific data collection mechanism for trading in carbon emissions. Some data has been reported in recent quarters via the Quarterly International Trade in Services and Royalties Survey. This activity is being monitored via media and other reports to ensure it is captured within the BOP statistics. The BoP unit is also planning to conduct a census of international trade in services and royalties in 2011. As part of this survey's questionnaire development process, options for including a specific question on carbon emissions trading will be considered.

In addition to trading in emissions rights, it is expected that there will be international trading in financial derivatives associated with carbon emissions that will involve New Zealand residents. The BoP unit currently collects the value of financial derivatives contracts held by New Zealand entities with non-resident counterparties at the end of the quarter via the Quarterly International Investment Survey. In addition to the quarter-end derivatives value, this survey captures the stock and flow of borrowing and lending by approximately 500 large New Zealand entities with non-residents. This survey will continue to be the basis for capturing data on

financial derivative contracts in carbon emissions with non-residents. There is no way to distinguish the value of derivative contracts relating to carbon emissions from other derivative contracts within the current reporting system.

In summary, the measurement of emissions trading in the Balance of Payments and International Investment Position Statistics is:

- transactions between residents and non-residents are being treated as intangible, non-produced, non-financial assets in the BoP statistics
- individual transactions in derivatives associated with carbon emissions will be captured in the BoP statistics but will not be separately identifiable from other financial derivatives.

5.2 National Accounts

5.2.1 Direct measurement

Under SNA93, a purchased carbon permit would be classified as a non-produced intangible asset. The definition of this type of asset reads: "non-financial intangible non-produced assets are constructs devised by society evidenced by legal or accounting actions. They make their appearance in the System when....transferable contracts are written....The writing of transferable contracts consists of the coming into force of a binding agreement that provides some economic benefit that can be passed on to a third party independently of the provider of that benefit" (SNA93 manual para 12.21, p267).

Investment in produced intangible assets such as software is captured in both annual and quarterly National Accounts, as part of gross fixed capital formation. The accounts also capture expenditure on non-produced intangible assets, but not as gross fixed capital formation, which is confined to produced assets. Transactions in non-produced intangible assets are recorded in the institutional sector capital accounts. At the total economy level, only net purchases of non-produced intangible assets with the rest of the world are recorded, as resident transactions net out.

Thus, there will be no direct impact on the current suite of National Accounts outputs. Purchased carbon credits would appear in the institutional sector accounts for capital which is not currently produced. If ETS permits are financial assets they will be captured in financial balance sheets which are currently not produced by Statistics NZ.

The New Zealand Treasury is treating the value of the credits issued as a liability in the Crown Accounts. This is an item in the government balance sheet and as such will not appear in the current suite of National Accounts measures.

5.2.2 Indirect measurement

By and large, rather than collecting it directly National Accounts will pick up the impact of the ETS indirectly from other areas:

- Prices: impact on price indexes will flow through wherever these are used in calculating volume measures.
- Annual Enterprise Survey: data will flow through into annual benchmarks.
- Quarterly indicators reflected in household spending, manufacturing, production, etc.
- Balance of Payments: external transactions (investment, trade, tourism).
- Government data will capture any holding of credits as assets as well as any money flow to be treated as taxation (expected to be zero).
- Agricultural Production Survey: agriculture volumes, prices impacts.
- Quarterly data:
 - i. price data received directly from selected respondents will show any impacts
 - ii. investment in ETS related/or carbon reduction related projects may come into data collected for Gross Fixed Capital Formation (GFKF)
 - iii. changes in volume data may be impacted such as forestry volumes, energy data, production volumes (manufacturing), and transport volumes.

In summary:

- the impact of the ETS scheme will not be captured directly in the current suite of National Accounts (and related) measures
- the ETS scheme will be indirectly captured in many of the source data for the National Accounts. It will be difficult, if not impossible to distinguish the impact of the ETS scheme from other impacts on the statistics.

5.3 Environmental statistics

Currently, there are a range environmental statistics available in New Zealand. These are produced by many national and regional government agencies and Crown research institutes.

The Ministry for the Environment (MfE) is responsible for the annual publication of the New Zealand Greenhouse Gas Inventory, which reports on emissions and removals of greenhouse gases as required under the United Nations Framework Convention on Climate Change and the Kyoto Protocol (ie the reporting is required, not the emissions and removals).

New Zealand has ratified the Kyoto Protocol and by doing so has committed to "reducing greenhouse gas emissions to 1990 levels on average over the 2008-2012 commitment period, or take responsibility for any emissions over these levels".

The New Zealand Greenhouse Gas Inventory is the primary statistic that will indicate any progress towards meeting the emissions targets from the introduction of the ETS. The inventory in itself will not capture any

information on the economic effectiveness of the ETS, merely record changes in the level of emissions over time.

Another possible impact of the ETS will be in changes in land use. These changes will be captured in statistics from the Land Use and Carbon Analysis System (LUCAS) program, led by MfE, as well as other statistics on land use and land cover produced by MfE, the Ministry of Agriculture and Forestry, and local, regional, and unitary councils. A major impact of the ETS may be a change in the amount of land in forestry (both natural and planted).

As mentioned above, there are a range of statistics that will greatly inform progress towards the reductions of carbon emissions. However, the introduction of the ETS will increase the demand for more detailed information to guide the finer points of ETS development, as well as to assess the success of specific policies in areas that are heavily related to emissions and climate change (eg energy, agricultural methane, and nitrates).

The energy domain plan (EDP), jointly developed by Statistics NZ, Ministry of Economic Development (MED), and Energy Efficiency and Conservation Authority (EECA), has identified greenhouse gas emissions and energy efficiency in several of its core topics. In response to the needs and priorities identified in the EDP, Statistics NZ is currently developing a statistics collection programme on energy consumption by industry, which will help inform key aspects of New Zealand's climate change policy, among other things. The energy domain plan focused on the environmental impacts of energy supply and the use of renewable energy. An environmental domain plan is currently being developed with key stakeholders, while *Stocktake for the Environment Domain Plan: 2010* (Statistics NZ, 2010) was published in March 2010.

In summary, the measurement of the environmental statistics will:

- be carried out by agencies other than Statistics NZ (eg Ministry for the Environment measuring the rate of emissions in the Greenhouse Gas Inventory, and changes in land use via the Land Use and Carbon Analysis System)
- record changes that may arise from the ETS but not the economic effectiveness of the ETS scheme
- be reflected in the finalised energy domain plan and environmental domain plan currently under development, in which greenhouse gas emissions and energy efficiency have been identified as core topics.

5.4 Price indexes

A common question asked around the implementation of the ETS is: what will be the impact on prices? It is assumed that raising the costs of production by bringing an externality into the production function will lead to an increase in prices.

Any overall increase in the price to the final consumer of a good or service resulting from the introduction of ETS will be captured (assuming the good

or service in question is in the basket of the particular index). For example, should electricity prices rise due to the producer having to buy carbon credits, then the rise in electricity prices will be shown in the consumers price index (CPI) for households, and in the electricity generation and supply outputs index of the producers price index (PPI) for electricity producers, as well as in the input indexes of the PPI for other producers. The price indexes will record an 'indirect effect', in that the price has changed and one possible cause of the change is the ETS scheme. It will not be possible to state how much of any change is due to the ETS. An analogy of this is the introduction of GST and its effect on the CPI in 1986. The CPI recorded an 8.9 percent increase in the first quarter of GST being in operation (December 1986 quarter). It is not possible to assign how much of the increase was due to GST itself as opposed to other factors occurring in the same period.

If the cost of buying ETS credits is deemed to be intermediate consumption and placed in the basket with an appropriate weight, it will be reflected in the input indexes of the PPI. This would capture the direct impact of the ETS on a particular industry's input prices. Given the conceptual treatment of ETS credits as non-tangible assets under SNA93, or taxes and some form of financial or split asset under SNA08, they will not be classified as intermediate consumption, or a part of the production function, and therefore are out of scope of the PPI.

In summary, the impact of the ETS scheme on the measurement of price change in the current suite of price indexes will:

- not be directly recorded in either the CPI or PPI
- record indirect effect, but will not be attributable to how much of the price change is due to the operation of the ETS scheme.

5.5 Annual Enterprise Survey

The ease of capture of this information and the position of capture in the Annual Enterprise Survey (AES) questionnaire will be determined by the relevant tax treatment of the credits.

Provided the emission credits are intangible assets, these will be captured within the current AES questionnaires. However, AES would be unable to separate emission credits from the total value of intangible assets. Any subsequent revaluation of these credits is likely to flow through either the non-operating income or non-operating expense question, which as above is collected as a total and not split into specific items.

In summary, the AES will capture some information, but under the current questions this data will not be identifiable.

5.6 Future administrative data sources

The ETS will involve a register of emission credit trades maintained by the Ministry of Economic Development. This data source may have the potential to provide some of the information required by Statistics NZ about the ETS itself. The data source may also provide statistics or data to address some of the policy-related questions posed in chapter 3.

The register may also allow Statistics NZ to incorporate data into aggregate statistics, which may reduce or eliminate the need to survey specifically for this data. Alternatively, it may allow us to provide greater breakdowns of the impact of the ETS scheme. The risk of double counting the impact of ETS from using varied data sources will have to be investigated and mitigated.

Statistics NZ will engage with the Ministry of Economic Development to understand what data is being recorded in the register and the potential use of this. We are also investigating international experience in the use of similar registers for statistical purposes.

5.7 Research

Statistics NZ makes research data available to approved researchers in the Statistics NZ Data Lab. This data can be used for research into potential effects of the ETS scheme.

The Ministry of Economic Development has used the Statistics NZ Data Lab facility to produce analysis on the potential impact of the ETS scheme on the manufacturing sector. This research is documented in the occasional paper entitled *Impact of Emissions Pricing on New Zealand Manufacturing: A Short-Run Analysis* published on the Ministry of Economic Development website in March 2010.

The opportunity exists for further research into the micro-level effects of the ETS scheme by approved researchers for approved research purposes.

For more information see the Statistics NZ website under Statistics NZ Home > Methods and services > Microdata access > Data Lab.

6 Conclusion

The introduction of ETS into the New Zealand economy is a significant change. The capture of this event will require Statistics NZ to make decisions on the conceptual and operational treatment of ETS credits.

Statistics NZ has a role in capturing the impact of the event in existing statistics. However, it is unclear at this stage what role we have in producing statistics about the ETS itself.

In measuring the impact on current statistics, Statistics NZ will adopt the latest SNA recommendation on treatment of ETS. Statistics NZ believes the taxation component will be zero and the treatment will default to either a financial asset (of some type), or a split asset that is in part a financial asset (of some type) and non-produced, non-financial asset. This treatment impacts how the effects will be reported in existing statistics. In particular it will mean that the ability to identify the effect on prices will be limited.

Some impacts of the ETS will be captured in some form in the existing OSS statistics. Economic statistics will reflect them in aggregate form or as 'indirect effects'. Environmental statistics will capture any possible change in environmental conditions, which may be attributable to the ETS. Specific statistics around the ETS do not currently exist.

The existence of a register for ETS trades may be a fruitful source of data and statistics on the ETS and its impact.

The specifics of the ETS in New Zealand are evolving and as a statistical office, Statistics NZ still has areas to investigate around measuring this event. In some cases, the operational treatments (eg the final National Accounts treatment of credits) are still being developed. Therefore, the conclusions outlined in this paper may be subject to refinement and modification as more information becomes available.

References and further reading

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Further reading

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Appendix 1 New Zealand's emissions trading scheme

1.1 Basic logic

The basic premise of the ETS is that its participants are required to 'surrender' one carbon credit for each tonne of carbon dioxide equivalent (CO₂-e) they emit. The ETS also has provision for participants that remove a tonne of CO₂-e from the atmosphere to earn a carbon credit. These carbon credits can be on-sold for a profit.

1.2 2009 Act changes¹

- revised entry dates of 1 July 2010 for transport, energy, and industrial sectors, and 1 January 2015 for agriculture.
- a transitional phase until 1 January 2013 with a 50 percent obligation and \$25 fixed price option for the transport, energy, and industrial sectors.
 - i. Participants in the liquid fossil fuels, stationary energy and industrial processes sectors are only required to surrender one eligible unit for every two tonnes of CO₂-e emitted and have an option to pay \$25 in lieu of surrendering a unit in satisfaction of unit-surrender obligations
 - ii. the export of New Zealand units from the NZ ETS is prohibited, with the exception that the prohibition will not apply to the export of forestry-related New Zealand units; and participants in the forestry sector (from 1 January 2008 to 31 December 2012) are required to surrender one eligible unit for every tonne of CO₂-e emitted and have the option to pay \$25 in lieu of surrendering a unit in satisfaction of unit surrender obligations:
- a production-based industry average approach to allocations for trade-exposed, emissions-intensive businesses This provides for free allocation of New Zealand units to emissions-intensive, trade-exposed industries on an intensity basis, with eligibility thresholds and phase-out rates for free allocation set at levels to reduce trans-Tasman competitiveness risks (for more information see sections 3.5, 3.56 below)
- a phase-out of industry support aligned with trading partners and the Government's long-term -50 by 2050 emissions reduction target
- incentives for afforestation created by a domestic and international market for carbon credits

¹ Based on information on www.climatechange.govt.nz and summary to the bills.

- enhanced transitional support for the fishing industry. By increasing free allocation of New Zealand units to the fishing sector to 90 percent of 2005 emissions levels for 1 July 2010 to 31 December 2012
- a Treaty of Waitangi clause.

1.3 Sectors and gases

The New Zealand emissions trading scheme will aim to include all sectors and all gases by 2013. The sector divisions are based on the nature of the carbon emissions. The following sectors will have a compulsory participation in the ETS:

- forestry (planted before 1990)
- liquid fossil fuels (carbon emissions, mainly transport)
- stationary energy (carbon emissions)
- industrial processes (industrial process emission, not related to energy)
- agriculture (methane and nitrous oxide from fertiliser use and digestion)
- waste (methane emissions from decomposing waste).

The following sectors can participate in the ETS in voluntary basis:

- forestry (planted after 1989)
- industrial processes (carbon removal activities)
- transport (major jet fuel purchasers)
- stationary energy (major coal and gas purchasers).

The gases identified to be part of the ETS are the following:

- carbon dioxide (CO₂)
- methane (CH₄)
- nitrous oxide (N₂O)
- hydrofluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulphur hexafluoride (SF₆).

1.4 Units

In the New Zealand ETS the primary unit of trade will be the New Zealand Unit (NZU), which is a unit created and distributed by the New Zealand government. In a similar fashion to other systems, one NZU is equivalent to one tonne of CO₂-e.

In an internationally-linked ETS there are a number of national units traded in the carbon exchanges. Annex B of the Kyoto Protocol contains a list of signatory countries and their quantified emission limitations or reduction commitments; New Zealand is an Annex B country. The main units are described below:

1. Assigned Amount Units (AAUs) – units freely allocated to Annex B countries to match the level of their emissions reduction or limitation commitment.
2. Emission Reduction Units (ERUs) – generated by Joint Implementation projects that reduce emissions or create forest sinks in Annex B countries.
3. Removal Units (RMUs) – awarded to Annex B countries on the basis of net removals by sinks in the land use, land-use change and forestry sector.
4. Certified Emission Reductions (CERs) – generated by Clean Development Mechanism (CDM) projects that support sustainable development and reduce emissions or create forest carbon sinks in developing countries. Note that forestry CDM units (CERs and ICERs) may not be surrendered to meet obligations in the NZ ETS.

Emissions units can be acquired in a number of ways:

- receiving a free allocation from the government
- buying them from the government
- buying them from approved overseas sources
- buying them from another participant or third parties (eg brokers or trading exchanges).

It is of note that this list indicates the intention to link the New Zealand ETS internationally. At the same time, however, the ‘approved’ overseas sources of the third item will be strictly regulated. For example, it is highly possible that some AAUs from Eastern Europe will not be allowed in the New Zealand ETS as they are a product of an accounting system and do not represent real emissions savings.

1.5 Mechanics

Sectors will be phased into the ETS at differing times:

- forestry – January 2008
- stationary energy – July 2010
- industrial processes – July 2010
- liquid fossil fuels – July 2010
- waste – January 2013
- HFCs and PFCs – January 2013
- agriculture – July 2015.

Once a sector is introduced into the ETS its participants have a number of obligations:

- have an account to hold emission units with the NZ Emissions Units Register

- monitor their emissions and removal of emissions in accordance with methodologies that will be prescribed in regulations
- report annually by 31 March on any emissions or removals that resulted from their activities in the previous year (except for post-1989 forest participants, who may report at the times defined in new section 167)
- surrender one emission unit for each tonne of emissions (or earn one emission unit for each tonne of emissions removed)
- retain records showing their emissions and removed emissions for seven years.

1.6 Eligibility for assistance²

As mentioned in section 3.2, the 2009 Act allows for government assistance for trade exposed and emissions intensive enterprises. This section outlines the criteria for this assistance and the following section provides the levels of assistance available.

The 2009 changes contain two tests that activities must pass before they are considered eligible: a trade exposure test and an emissions intensity test.

The trade exposure test prevents assistance from being granted to activities where:

- the activity is electricity generation
- there is no international trade of the output of the activity across oceans
- it is not economically viable to import or export the output of the activity.

The emissions intensity test is based on tonnes of emissions per 1 million New Zealand dollars of revenue. Under this test there are two thresholds:

- a moderately emissions-intensive threshold of 800 tonnes of CO₂-e per 1 million New Zealand dollars of revenue, as compared against the weighted average emissions intensity from those conducting the activity in New Zealand
- a highly emissions-intensive threshold of 1,600 tonnes of CO₂-e per 1 million New Zealand dollars of revenue, as compared against the weighted average emissions intensity from those conducting the activity in New Zealand.

The intention is for data from the financial years 2006/07, 2007/08, and 2008/09 to be used in applying the thresholds.

These emissions intensity thresholds are broadly equivalent to the revenue thresholds in the CPRS, adjusted for the exchange rate. The use of a

² The information in this and following section is from the *Industrial allocation update* on the www.climatechange.govt.nz website.

sector average means even where one firm is particularly emissions intensive, it will not qualify for free allocation if the activity average does not meet the thresholds. The converse also applies.

In addition to using these emissions intensity thresholds, the Minister for Climate Change Issues may confer eligibility on trade-exposed activities if the same activity meets equivalent thresholds under the CPRS, or is likely to do so.

The current intent is to define the types of emissions that are to be included in the calculation of an activity's weighted average emissions intensity through regulations.

As noted below, where eligibility is conferred on the basis of eligibility of the same activity under the CPRS, liquid fossil fuels may be included in allocative baselines to the same extent they are under the CPRS.

The Bill does not contain emissions intensity thresholds that allow activities to qualify on the basis of emissions as a proportion of value added.

The Bill allows flexibility for the Minister for Climate Change Issues to use a figure representing the 'emissions intensity' of electricity used for determining eligibility under the CPRS (1 tonne of CO₂-e per MWh), although this figure is not stated in the Bill. The current intent is to use the same figure used under the CPRS.

1.7 Levels of assistance

There will be two tiers of assistance depending on whether the activity is moderately or highly emissions intensive. These levels begin at 60 percent and 90 percent of the allocative baseline (a benchmark number of NZUs per unit output) for the activity and phase-out at a rate of 1.3 percent from 2013 (calendar year). This means that in 2013 the rate of assistance for highly emissions eligible activities will be 90 percent x 98.7 percent = 88.8 percent and so on.

For eligible activities, the Minister for Climate Change Issues will establish allocative baselines based on either:

- the average emissions and electricity use per unit output from the activity, based on data collected from those undertaking the activity in New Zealand in the financial years 2006/07, 2007/08, and 2008/09
- information on equivalent emissions and electricity use per unit output from Australia.

The second of these considerations is designed to allow the adoption of allocative baselines that have been developed in Australia, with modifications to reflect the different emissions intensities of electricity generation in the two countries.

The intent is that the electricity 'allocation factor' used to develop allocative baselines will be a New Zealand factor such as the one developed by the Stationary Energy and Industrial Processes Technical Advisory Group (0.52 tonnes of CO₂-e per MWh).

The classes of emissions from an activity that can count towards allocative baselines will be the same as emissions that count towards the industrial allocation 'pool' under the existing Climate Change Response Act, except where eligibility is conferred on the basis of eligibility under the CPRS, emissions from liquid fossil fuels will be able to be considered to the same extent they are in the CPRS.

There is no intent to update allocative baselines during commitment period 1 of the Kyoto Protocol.

Appendix 2 Comparisons with overseas schemes

2.1 European Union ETS

The EU ETS is the world's largest emissions trading scheme. The EU ETS currently covers more than 10,000 installations in the energy and industrial sectors which account for close to half of the EU's emissions of CO₂.

Basic logic

Similar to the New Zealand ETS, EU ETS participants are required to 'surrender' one carbon credit for each tonne of CO₂ emitted. The ETS also has provision for participants that remove a tonne of CO₂ from the atmosphere to earn a carbon credit. These carbon credits can then be on-sold for a profit.

Sectors and gases

The EU ETS targets the energy and industrial sectors (ie large single emitters), for example, electricity generation, metal works, and pulp and paper. There is potential for more sectors to be added post-2012, such as air travel.

The GHGs included in this mechanism are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).

Units

The main units to be traded in this ETS are those issued by the EU member countries, up to the caps established by the EU.

In addition, the EU ETS enables companies to purchase CERs and ERUs generated through the CDM and JI initiatives respectively to meet their obligations. See below for more details:

1. Emission Reduction Units (ERUs) – generated by Joint Implementation projects that reduce emissions or create forest sinks in Annex B countries
2. Certified Emission Reductions (CERs) – generated by Clean Development Mechanism (CDM) projects that support sustainable development and reduce emissions or create forest carbon sinks in developing countries. Note that forestry CDM units (CERs and ICERs) may not be surrendered to meet obligations in the NZ ETS.

Mechanics

Under the EU ETS, the EU Member States agree on national emission caps that have to be approved by the EU commission. The EU states then allocate allowances to their industrial operators, track and validate the actual emissions. At end of the reporting period industrial operators are required to surrender credits equivalent to their emissions.

2.2 West Coast North America

Seven western US states and four western Canadian provinces have formed the Western Climate Initiative (WCI) to identify, evaluate, and implement collective and cooperative ways to address climate change through a regional reduction of greenhouse gases. Members include: Arizona, California, New Mexico, Oregon, Washington, Montana, and Utah (US), and British Columbia, Manitoba, Ontario, and Quebec (Canada). Together, the seven states and four provinces represent over 70 percent of the Canadian economy and 20 percent of the US economy.

The WCI partners are implementing a market-based cap-and-trade program as part of a regional effort to reduce GFG emissions by 15 percent below 2005 levels by 2020. The WCI cap-and-trade program will cover emissions of the six main greenhouse gases (carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)) from the following sectors of the economy:

- electricity generation, including imported electricity
- industrial and commercial fossil fuel combustion
- industrial process emissions
- gas and diesel consumption for transportation
- residential fuel use.

Covered entities and facilities will be required to surrender enough allowances to cover emissions that occur within each three-year 'compliance period'.

The first phase of the cap-and-trade program begins on 1 January 2012 covering emissions from electricity (including imported electricity), industrial combustion at large sources, and industrial process emissions for which adequate measurement methods exist. The second phase begins in 2015, when the program expands to include transportation fuels and residential, commercial, and industrial fuels not otherwise covered.

Allowances, banking, and offsets

A limited number of allowances will be available to entities and facilities covered by the program.

Companies covered by the rules will be able to purchase allowances at auction, buy and sell them on secondary markets, or bank them for future use. In certain cases companies also will be able to purchase a limited number of offset credits that reflect reduced carbon emissions elsewhere. They may also be able to purchase allowances from other comparable cap-and-trade programs approved in the future.

2.3 East Cost of North America

Some states on the east coast of the United States and Canada have joined in the Regional Greenhouse Gas Initiative (RGGI). Members are states who have signed the memorandum of understanding, and include the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. In addition, the state of Pennsylvania and the District of Columbia, as well as the Canadian provinces of Ontario, Quebec, and New Brunswick are observers to the process.

The stated aim of RGGI is "a cooperative effort by Northeastern and Mid-Atlantic states to reduce carbon dioxide emissions – a greenhouse gas that causes global warming. Climate change is expected to raise sea level, change precipitation and impact other local climate conditions. Changing regional climate could alter forests, crop yields, and water supplies. It could also affect human health, animals, and many types of ecosystems." They are addressing this by means of a multi-state cap-and-trade program which has a market-based emissions trading system as the trade component. The proposed program will require electric power generators in participating states to reduce carbon dioxide emissions. The RGGI budget trading program was based on the "model rule", which was developed to help provide guidance and consistency to states that signed the memorandum of understanding (MOU).

Applicability

- The model rule required fossil fuel-fired electric generating units serving a generator of 25MW or larger to comply with the budget trading scheme.
- Units of this size are responsible for 95 percent of the emissions from the electric generation sector.
- An electric generator unit which began operation before 1 January 2005 is considered to be 'fossil fuel-fired' if fossil fuels comprise more than 50 percent of its total annual heat input. Electric generator units that began operation after 1 January 2005 are considered fossil fuel-fired if fossil fuels comprise more than 5 percent of its input.
- Emissions produced by 'eligible biomass' can be deducted from the unit's compliance obligation.
- The definition of 'sustainably harvested biomass' would be made by regulatory agencies in each participating state.

Size and structure of cap

- Members are required to stabilize power sector emissions over the first six years (2009–14) at the level of current emissions.
- Between 2015–18, members are required to reduce emissions by 2.5 percent annually.

Permitting

- Members require an emissions monitoring plan (EMP) by an appropriate agency.
- Members that are subject to acid rain program may already have an emissions program in place and may just extend this to CO₂, whereas other states would need to build one.

Allowance allocation

- A regional emissions budget cap was stated in the MOU.
- Members can sell allowances through a regional auction, setting the value at which the allowances would enter the market.
- This method is to encourage end-use energy efficiency and other measures.

The model rule includes a number of temporal flexibility mechanisms such as:

- banking enables facilities to carry over unused allowances with no restrictions.
- a three-year compliance period enables facilities to adjust to the change in the environment (high fuel prices, higher demand, etc).

Emissions monitoring

- Units must record CO₂ emissions.

Appendix 3 Background of the paper

This paper had its genesis in an earlier version submitted to the Advisory Committee on Economic Statistics (ACES) on 30 October 2008. The paper to the ACES committee outlined understanding of the proposed emissions trading scheme (ETS) at that time and the options for treatment of the ETS. The paper asked the committee's guidance on the following questions:

- What role do you see for Statistics NZ in measuring ETS?
- Are you happy with the conceptual frameworks for treatment of ETS?
- Are there important gaps in our system for capturing information and what are the options for filling them?
- What do we still not know about ETS?
- What are the ETS priorities for ACES and what (if any) are the potential trade-offs for these?
- Would the committee see value in Statistics NZ publishing a discussion paper on the statistical treatment of ETS?

The ACES committee noted this was a very good paper and expressed a number of views about the role of Statistics NZ, including:

- Reporting should be on New Zealand's emissions and the trade of emissions credits rather than on the ETS scheme, which is both partial and subject to change
- Regardless of who is collecting data (Ministry for the Environment (MfE) and Ministry for Economic Development have legal obligations to do so), there is an OSS leadership role for Statistics NZ in ensuring the quality, robustness, and consistency of conceptual treatment with other environmental externalities. Statistics NZ may archive data produced by MfE so that time series are available.
- It was suggested that a published discussion paper would be very welcome.

It was noted to the ACES committee that knowledge of the operational aspects of the ETS is still limited. There are many questions for which answers were not known. Therefore, the treatment outlined in the paper was based on the current best knowledge at the time but could change as further information was obtained.

Appendix 4 New Zealand's taxation treatment

4.1 Income tax treatment of emissions units relating to post-1989 forestry land

Emissions unit transactions relating to post-1989 forestry land are generally treated as being on revenue account. This means that taxable income arises, and tax deductions are created, as a result of these transactions. Timing rules apply to these liabilities and deductions. Specifically:

- no taxable income arises on the receipt of units which are allocated by government in relation to carbon capture
- the sale of any units gives rise to taxable income. If the units sold are allocated units, or units purchased to replace units sold previously, then the entire proceeds will be subject to income tax. Otherwise, any 'profit' on the sale will be taxable income
- the purchase of units to replace units which were previously sold is deductible
- the purchase of units in excess of those sold will not give rise to a deduction at that time.

4.2 Income tax treatment of emissions units relating to pre-1990 forestry land

Emissions unit transactions relating to pre-1990 forestry land are generally treated as being on capital account, which means that no income tax liabilities arise, and no tax deductions are created by transactions in emissions units. Specifically:

- no taxable income arises on the receipt of units allocated by the government
- no taxable income arises if any government-allocated units are sold by the recipient
- no income tax deduction arises if additional units are purchased to satisfy a deforestation liability
- no income tax deduction arises on the surrender of units.

The exception to the rules described above is the small number of businesses which hold pre-1990 forest land on revenue account – typically property developers and similar businesses. Their transactions will be on revenue account.

4.3 Income tax treatment of emissions units allocated to non-forestry businesses

Certain non-forestry businesses will be allocated 'free' emissions units by the government. In some instances these businesses will have a liability to surrender emissions units, and other businesses will simply be facing increased costs for inputs, such as electricity (and will probably sell the 'free' emissions units to benefit from the allocation).

This allocation of emissions units is on revenue account, so taxable income will arise. This tax liability does not arise immediately on allocation of the units, but is treated as arising on an emerging basis over the period to which the allocation relates, tracking the emissions liability, or increased cost, for which the award of free emissions units is intended to compensate.

4.4 Income tax treatment of liability of non-forestry businesses to surrender emissions units

A deduction is available for a business' liability to surrender emissions units. The business does not have to wait until the emissions units are actually surrendered; the deduction is available as the liability to surrender emissions units arises, following normal accrual accounting principles.

A business which simultaneously receives 'free' emissions units and accrues a liability to surrender emissions units will find that the income and deduction amounts at least partially offset.

4.5 Income tax treatment of sales and purchases of emissions units by non-forestry businesses

The sale of emissions units by a non-forestry business is on revenue account, so where units are sold for a price in excess of their cost, taxable income will be generated.

The purchase of units by a non-forestry business is also on revenue account, so a deduction will arise on their purchase. However, if the units are held at the end of the relevant income year, they will be treated in the books as an asset valued at cost, thereby offsetting the deduction.

4.6 GST treatment of emissions units – all sectors

The supply of emissions units is zero-rated. This means that emissions units are treated as being subject to GST for the purposes of measuring taxable supplies made by the business, but the amount of GST actually charged is zero.

Recent amendments have extended the range of unit attracting the zero rate of GST to include: Kyoto compliant unit, other approved overseas units, unit created under the Permanent Forest Sink Initiative (PFSI) and other emission units that do not fall within this description (referred to as 'grey market' or 'voluntary' units).

The transfer of emission units by government under schemes such as Project to Reduce Emission (PRE) and Negotiated Greenhouse Agreements (NGAs) attract the standard rate of GST. Subsequent transfers of such units are zero-rated.

Transactions which are treated in this way include:

- the allocation of emissions units by the government to a business
- the surrender of emissions units by a business to the government

- a sale of emissions units by a business, whether to a buyer in New Zealand or overseas
- the purchase of emissions units by a New Zealand buyer from an overseas vendor.

In some instances, deemed or actual supplies will be made in exchange for emissions units. These supplies will also be zero-rated where they are:

- made by the recipient of 'free' units allocated by the government – such as foresters who receive units from the government for carbon capture in growing forests
- made by the government in exchange for the surrender of units by businesses.